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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,094	12/10/2003	Takao Iwaki	2018-822	4521

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EXAMINER

JENKINS, JERMAINE L

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/731,094	Applicant(s) IWAKI ET AL.	
	Examiner Jermaine Jenkins	Art Unit 2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9,36-43,45-52 and 61-67 is/are rejected.
- 7) ☒ Claim(s) 10-35,44 and 53-60 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12102003</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 36-43 & 61-67 are rejected under 35 U.S.C. 102(b) as being anticipated by Busta (4,744,246).

In regards to claims 1, 41-43 & 61, Busta teaches a flow sensor for detecting flow of fluid having a thin film portion (11) includes a heater (16) and a detector (24, 26, 28, detector being interpreted as a temperature sensor) for detecting temperature around heater, and wherein the heater (16) is made of semiconductor (Column 4, lines 4-19).

With respect to claims 2, 3, 5, 6, 37, 39, 62, 63 & 65, Busta teaches the heater is made of semiconductor having P type conductivity and has a width in a range between 7 μ m-80 μ m and wherein the width of the heater is equal to or larger than 15 μ m (Column 5, lines 26-30).

With respect to claims 4 & 7, Busta teaches wherein the heater includes a plurality of line heaters, which are connected together in series, and wherein the line heater flows current in a direction, which is opposite to a direction of current flowing in a neighboring line heater (Column 6, line 63 – Column 7, line 28).

With respect to claims 8 & 64, Busta teaches wherein the semiconductor having P type conductivity is a boron-doped silicon (Column 4, lines 42-44).

DETAILED ACTION

Election/Restrictions

1. Applicant's election of 1-67 in the reply filed on 12/14/2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 36-43 & 61-67 are rejected under 35 U.S.C. 102(b) as being anticipated by Busta (4,744,246).

In regards to claims 1, 41-43 & 61, Busta teaches a flow sensor for detecting flow of fluid having a thin film portion (11) includes a heater (16) and a detector (24, 26, 28, detector being interpreted as a temperature sensor) for detecting temperature around heater, and wherein the heater (16) is made of semiconductor (Column 4, lines 4-19).

With respect to claims 2, 3, 5, 6, 37, 39, 62, 63 & 65, Busta teaches the heater is made of semiconductor having P type conductivity and has a width in a range between 7μm-80μm and wherein the width of the heater is equal to or larger than 15μm (Column 5, lines 26-30).

With respect to claims 4 & 7, Busta teaches wherein the heater includes a plurality of line heaters, which are connected together in series, and wherein the line heater flows current in a direction, which is opposite to a direction of current flowing in a neighboring line heater (Column 6, line 63 – Column 7, line 28).

With respect to claims 8 & 64, Busta teaches wherein the semiconductor having P type conductivity is a boron-doped silicon (Column 4, lines 42-44).

With respect to claims 9 & 65, Busta teaches wherein the semiconductor having P type conductivity has an impurity concentration being equal to or larger than $1 \times 10^{20} \text{cm}^{-3}$ (Column 4, lines 38-42).

With respect to claim 36, Busta teaches wherein the heater is made of boron doped silicon, and has a narrow portion (Column 4, lines 38-42), wherein the narrow portion narrows a width of the heater in a direction perpendicular to a current flow direction of the heater so that the narrow portion limits the current flowing in the heater (See Figure 1), wherein the narrow portion has a minimum width being equal to or larger than $7 \mu\text{m}$ (Column 5, lines 26-30).

With respect to claims 37 & 39, Busta teaches wherein the minimum width of the narrow portion is equal to or larger than $15 \mu\text{m}$ (Column 5, lines 26-30).

With respect to claim 38, Busta teaches wherein the heater includes a plurality of line heaters connecting together in parallel, and wherein each line heater is made of boron doped silicon, and has a width being equal to or larger than $7 \mu\text{m}$ (Column 5, lines 36-45).

With respect to claims 40-43, Busta teaches a lead wire connecting to the heater for supplying electric power to the heater, wherein the heater is provided by a resistor, wherein the

resistor and the lead wire are made of semiconductor film, and wherein the resistor is locally thinned (Column 2, lines 9-12; See Figure 1).

With respect to claim 66, Busta teaches wherein the heater is made of phosphorous doped polycrystalline silicon (Column 7, lines 36-37).

With respect to claim 67, Busta teaches wherein the phosphorous doped poly crystalline silicon has a phosphorous concentration being equal to or larger than $2 \times 10^{20} \text{cm}^{-3}$ (Column 4, lines 38-42 & Column 7, lines 36-37).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 45-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Busta (4,744,246) in view of Gluck (6,725,724).

With respect to claims 45 & 49, Busta teaches the claimed invention except for a passivation film, wherein at least one of the heaters and the detector is made of a semiconductor resistor, wherein the passivation film covers the heater and the detector, and wherein the semiconductor resistor has a surface covered with thermal oxidation film.

Gluck teaches a thin-film semiconductor having a passivation film (50) the covers the detector (Column 2, lines 22-35). It would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture a passivation film as taught by Gluck in

the semiconductor of Busta for purpose of ensuring a good electric insulation in a cost-effective manner (Column 1, lines 47-49; Gluck).

With respect to claims 47 & 48, Gluck teaches a passivation film (50), wherein the passivation film covers at least one surface of the heater and the detector, one surface being disposed in a passage of the fluid, and wherein the passivation film (50) is made of silicon nitride film having silicon rich composition, in which a ratio of silicon to nitrogen is larger than that in a stoichiometric composition (Column 2, lines 36-39).

With respect to claims 46, 50-52, Busta and Gluck teaches the claimed invention except for the passivation film has a refractive index between 2.1 & 2.3 and having a thickness of being equal to or larger than 0.6 μ m. It would have been obvious to one having ordinary skill in the art that the time the invention was made to manufacture the passivation film having a refractive index between 2.1 & 2.3 and having a thickness of being equal to or larger than 0.6 μ m, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Therefore it would have been obvious to one having ordinary skill in the art that the time the invention was made to manufacture the thickness and refraction of the film for purpose of being cost-effective and easy to manufacture.

Allowable Subject Matter

5. Claims 10-35, 44 & 53-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent 6,441,451 (Ikeda et al) – Pressure Transducer and Manufacturing Method Thereof

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermaine Jenkins whose telephone number is 571-272-2179. The examiner can normally be reached on Monday-Friday 8am-430pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jermaine Jenkins
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